

Appl. No. 10/016,624
Amdt. dated July 19, 2004
Reply to Office Action of May 17, 2004

REMARKS

In the Office Action dated May 17, 2004, the restriction requirement was made final; and the rejections from the previous Office Action (dated December 2, 2003) were maintained.

RESTRICTION REQUIREMENT

A petition challenging the restriction requirement has been submitted concurrently herewith (copy attached for the convenience of the Examiner). As discussed in the petition, the restriction requirement is in error and should be withdrawn. Therefore, it is respectfully submitted that claims 6-10, 16, 20, 22, 23, 27-39, and 43 should remain in the application and should not be withdrawn.

REJECTIONS UNDER 35 U.S.C. §§ 102 AND 103

In the previous Office Action dated December 2, 2003, claims 1, 4, 5, 14, 15, and 25 were rejected under 35 U.S.C. § 102 over U.S. Patent No. 6,144,553 (Hileman); claims 11, 17-19, and 21 were rejected under § 103 over Hileman in view of U.S. Patent No. 6,152,213 (Suzuki); claims 12, 13, and 26 were rejected under 35 U.S.C. § 103 over Hileman in view of U.S. Publication No. 2003/0075312 A1 (Panek); and claims 2 and 3 were rejected under § 103 over Hileman in view of U.S. Publication No. 2003/0056938 A1 (McCullough).

It is respectfully submitted that Hileman does not disclose the subject matter of claim 1. Claim 1 recites a heat sink assembly including a heat conduit, a block formed of a thermally conductive material having a first thermal conductivity, and a heat conduit extending through a substantial portion of the block. The Office Action identified heat pipe 110 depicted in Figures 5 and 6 of Hileman as teaching the heat conduit of claim 1, and identified head disk assembly 130 as being the block recited in claim 1. Note that the head disk assembly 130 is part of a disk drive 102.

The present Office Action indicated that the thin conduction plates 104 of Hileman are also part of the head disk assembly 130. The present Office Action indicated that the claim 1 elements are satisfied by the heat pipe 110 of Hileman being

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connected to a thin conduction plate 104. Applicant respectfully disagrees with this assessment. As seen in Figure 7 of Hileman, each heat pipe 110 is a short stub that has one end connected to a back plane 106. The other end of the short heat pipe 110 is connected to a thin heat conduction plate 104, better shown in Figure 6 of Hileman. The connection of each heat pipe 110 to a *thin* conduction plate 104, as taught by Hileman, is *not* the same as extending a heat conduit *through a substantial portion* of the plate 104. The plate 104 of Hileman is rather thin, almost as thin as each heat pipe 110 (as shown in Figures 6 and 7 of Hileman). Therefore, the heat pipes 110 do *not* extend *through a substantial portion* of each plate 104.

Moreover, the length of the heat pipe 110 is much shorter than the length of the conductive plate 104 (as shown in Figures 6 and 7 of Hileman). Thus, even if the heat pipe 110 of Hileman were to be bored into the thin conduction plate 104, the heat pipe 110 would not be able to extend through a *substantial* portion of the thin conduction plate due to the relative lengths of the heat pipe 110 and the thin conduction plate 104. For this additional reason, claim 1 is not anticipated by Hileman.

Independent claim 24 is also not disclosed by Hileman, since Hileman does not teach extending an elongated heat conduit through a substantial portion of a block. Again, all that is disclosed in Hileman is one end of a heat pipe 110 connected to a back plane 106, and the other end of the heat pipe 110 connected to a thin conduction plate 104.

Independent claim 31¹ recites a heat sink having a block formed of a thermally conductive material, with the heat sink having a first segment and a second segment. The heat sink further includes a heat conduit extending *through the block* between the first and second segments, with the first segment to transfer heat from the heat conduit in a first direction, and a second segment to transfer heat away from the heat conduit in a second direction. Such a feature is not disclosed by Hileman.

Claims dependent from the independent claims are allowable for at least the same reasons as corresponding independent claims.

¹ Claim 31 was incorrectly indicated by the Examiner as being withdrawn. Applicant respectfully submits that claim 31 should not be withdrawn, as explained by the Petition submitted herewith.

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Claim 11 (which depends indirectly from claim 1) was rejected as being obvious over the asserted combination of Hileman and Suzuki. Applicant respectfully submits that the asserted combination of references does not teach or suggest the subject matter of claim 11. The Office Action cited Figures 15a, 15b, and 15c of Suzuki as disclosing the block with airflow channels. Note, however, that the airflow channels disclosed in Figures 15a and 15b are part of a heat sink 10 with a cooling fan that has a heat sink plate 12. Suzuki, 1:30-31. The dense electronic package 20 is attached to the heat sink plate 12. There is no indication whatsoever that heat pipes can extend into the heat sink 10. Therefore, the hypothetical combination of Hileman and Suzuki fails to disclose the following element of claim 11: an assembly having a block and a heat conduit extending through a substantial portion of the block, where the block has airflow channels to provide surfaces on the block exposed to airflow. Although the heat sink 10 of Suzuki has airflow channels, there is no suggestion whatsoever within Suzuki or Hileman that airflow channels can be provided in a heat sink through which a heat conduit extends. Therefore, a *prima facie* case of obviousness has not been established with respect to claim 11.

In response, the present Office Action remarked that "applicant claims that the block has airflow channels to provide surfaces on the block exposed to airflow in which Suzuki '213 does (*see* Figures 15a, 15b, and 15c)." 5/17/2004 Office Action at 3. This comment does not paint the whole picture of claim 11, where the block that has the airflow channels must also be the block through which the heat conduit extends. It is noted that although the heat sink 10 of Suzuki has airflow channels, there is absolutely no suggestion whatsoever within Suzuki, or Hileman, that airflow channels can be provided in a heat sink through which a heat conduit extends. Therefore, even if Hileman and Suzuki can be combined, the asserted combination of Hileman and Suzuki fails to teach or disclose *all* elements of the claim. A *prima facie* case of obviousness has thus not been established with respect to claim 11.

Claims 17-19 and 21 were also rejected as being obvious over the asserted combination of Hileman and Suzuki. Because the rejection of the base claim (claim 1)

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over Hileman is defective, it is respectfully submitted that the obviousness rejection of claims 17-19 and 21 over Hileman and Suzuki is also defective.


Similarly, because the rejection of base claim 1 over Hileman is defective, the obviousness rejection of claims 2 and 3 over Hileman and McCullough is also defective.

The obviousness rejection of claims 12 and 13 over Hileman and Panek is also defective because the rejection of base claim 1 over Hileman is defective. Similarly, the obviousness rejection of claim 26 over Hileman and Panek is defective because the rejection of base claim 24 is defective.

Allowance of all claims is respectfully requested. The Commissioner is authorized to charge any additional fees, including extension of time fees, and/or credit any overpayment to Deposit Account No. 50-1673 (9926).

Respectfully submitted,

Date: July 19, 2004



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